

7. Print Versus Electronic: Editors' Insights on the Costs and Benefits of Online Journals

by Brian D. Angell and Gabie E. Smith

In this article explore issues relating to the print publication process and the electronic publication process in order to clarify the unique advantages and disadvantages of each media. The literature describing the primary benefits and costs of online journals is reviewed. The results of a survey of viewpoints of a sample of electronic journal editors on the current state and future directions of online publishing is summarized. Finally, the literature review and the survey data are extended to identify implications for the future of online and print media.

THE SETTING

Over 15 years ago the electronic/computer revolution was predicted to dramatically alter and decrease the use of print publications (Lancaster, 1978). It has been suggested that the catalysts of these changes are electronic information databases, in general, and electronic journals, in particular. Electronic journals have been defined as "any serial produced, published, and distributed nationally and/or internationally, via electronic networks such as Bitnet and the Internet" (McMillan, 1991, p. 97). The term *online journals* has been used for electronic journals for which there is a printed counterpart (Langschied, 1992), although we will use the terms *online/electronic journals* interchangeably. When initially created, it was thought that electronic journals and databases would reshape the physical structure and purpose of libraries. Specifically, it was predicted that electronic information sources would shift libraries from being storehouses and providers of print materials to being providers of computer-based information systems (Schauder, 1994). In fact, the primary goal of electronic journals was to replace the existing print media (Turoff & Hiltz, 1982).

Although the electronic revolution has not resulted in complete replacement of printed publications by electronic media, the technological advances of the computer age have dramatically altered the relation between

information sources and society as a whole. Miller and Dufek (1995) have suggested that electronic information sources such as electronic journals are developing more rapidly than were expected, or even imagined. Many authors have predicted, however, that printed materials will never be totally replaced by their electronic counterparts. The future role of print media has been paralleled to that of horses (Dizzard, 1994). For example, horses are still available for use, but their uses have been dramatically restricted as compared to the past; likewise, print media will be successful only if it is utilized for applications for which print is best. In particular, Bagdikian (1971) has suggested that print is more efficient for certain applications (such as titles of ownership, resumes, and transcripts), and will therefore be a permanent fixture in our society.

BENEFITS AND COSTS—VIEWS IN THE LITERATURE

Collins and Berge (1994) suggested that print journals and online journals can be distinguished by their respective costs of production and distribution, and that online journals are typically less expensive. Print and electronic journals also differ in the timing and type of feedback they elicit from readers (Collins & Berge, 1994; Harnad, 1992). The format of electronic journals can allow for immediate feedback from readers and response from author or editor, whereas this process can take up to two years for print journals. A benefit that has contributed to the rapid growth of online journals is the addition of sound, graphics, and movies, which can be embedded in journal articles (Miller & Dufek, 1995). The ability of online journals to create links to other information sources such as related journals or web sites is another benefit.

The higher acceptance rates of submitted articles (Shamp, 1992; Smith, 1991) of online journals as compared to print journals is another benefit, although higher acceptance rates alone have not been viewed universally as an

advantage. Although online journals can speed up the peer review and publication process, there are a limited number of online peer-reviewed journals. In fact, critics have referred to the lack of peer-reviewed online publications as one indication that electronic journals have not lived up to their proposed potential (Wilson, 1991). The resistance of many scholars to publish in an online medium is related to, if not resulting from, the lack of credibility of online publications. For example, many authors in academic settings place importance upon the acceptance by a peer-reviewed journal. This is connected to credibility problems that arise in decisions of advancement at universities where online journal publications carry less weight than print journals (Collins & Berge, 1994).

Accessibility has been cited as another advantage of online journals. Online journals have the potential to reach a much greater number of people than do print journals. The wide accessibility of online journals is due to the Internet's development which McLuhan and Powers (1989) referred to as the foundation of the "Global Village." However, inaccessibility has more often been cited as a disadvantage of online journals, rather than an advantage. The problems with inaccessibility stem from two sources: lack of knowledge that the journal exists and lack of or difficulty with online access to the journal (Manoff, Dorschner, Geller, Morgan, & Snowden, 1992). Resolution of the problem of lack of knowledge that a journal exists seems relatively straightforward: by augmenting the sites that have been specifically developed for indexing and searching journal information on the Internet and carrying them on common servers.

The problem of lack of online access is quite complex. It involves the lack of physical access to a computer or telecommunications system. A significant portion of the global population does not have a computer readily available. In addition, when users have physical access to a computer but are unfamiliar

with the use of hardware, software, or the Internet, they lack training access. Lack of training access can hinder the use of online journals.

Inaccessibility constitutes the primary societal cost of electronic journals. There will always be people who do not have access to online information. The social implications of differential access can be great, broadening a gap between those who have access to knowledge and those who don't have access to knowledge. However, social institutions and social climate may have the most influence in changing lack of access to online journals. For example, the assimilation of computer-based technologies in the educational system has trained children to be knowledgeable users of online information and has given them physical access to computer technologies. Although there will be early adopters and late adopters of new technology, the fact remains that a certain percentage of the population will be non-adopters (i.e., those who never use the new technology) who will not have the same knowledge and information available to them as users.

Security of the journal material and security of the subscriber are other important issues related to online journals. Journal security problems are a potential cost to society and the journals themselves. The information included in any online journal can be altered after distribution, particularly when stored in public access sites (Collins & Berge, 1994). This is a cost to society because it leads to dissemination of inaccurate or altered information. Security could be improved by restricting access, but this also restricts readership. Moreover, the security of journal subscribers is a controversial issue. In particular, information regarding log-in time, files accessed and read, topics of interest, and personal information can be ascertained during online sessions. Many users feel that measuring these types of information is an invasion of their privacy, although some journal editors and advertisers claim that this information allows them to serve the subscriber better.

In sum, the literature suggests that the benefits of online journal publication include the lower cost of the publication process itself, speedier publication process, higher acceptance rates

for submitted articles, and wider accessibility to the material by readers. Inaccessibility has also been suggested as a major cost of online publications, as well as problems with security of the journal material and subscriber information. Several benefits and costs listed in the literature review are not unique to the online publication process. For example, there is broad range of acceptance rates for print journals, from those that have high acceptance rates to those that are highly selective. In addition, inaccessibility can be a problem with print media as well as online media. Finally, subscriber names and information from print journals are commonly sold or distributed to commercial businesses.

VIEWS OF SOME ONLINE EDITORS

A survey was conducted to assess the perceptions of those experienced with the online publication process. We wanted to determine the extent of agreement between the literature about costs and benefits and what editors of online media say about costs and benefits. So, we conducted a brief email survey of editors of currently available online journals.

Forty online journals were randomly selected (i.e., using a random permutation table) from an index of 1,057 journals on the Electronic Journal Universal Resource Location (<http://www.edoc.com.ejournal>). The online journals selected included a broad range of discipline and topic areas such as mathematics, dentistry, electronics, poetry, and economics. The editors were instructed to share their own opinions and experiences through their responses to seven questions. The questions sought to determine the following:

1. The primary goal of placing a journal online and whether the particular journal had a print counterpart.
2. Any specific problems encountered in producing their online journals.
3. Differences between online and print formats.
4. Differences in the audience/readership between online and print journals.
5. Forecasts of the future of print and online journals.

The information discussed here is based on the 26 complete responses returned from an original mailing of 40

(a 65% response rate). Generally, editors' responses to the questions concerning the primary goals and problems with online journals mirrored the advantages and disadvantages outlined in the literature review. For example, 19.2% of the editors listed both lowered costs of production and the increased production speed as primary reasons of online journal production.

The most widely cited reason given by 57.7% of the editors for producing an online journal was to explore this alternative publishing method. They were motivated by the creative possibilities of the online format as well as a desire to create a unique product. Editors also mentioned "filling a niche" or the lack of an online journal in the area as primary reasons for the online journal development. Responses to the second survey question revealed that fewer than half of the journals surveyed (42.3%) had an existing print journal counterpart. The lack of print journal counterparts was an important reason for starting an online journal. In fact, filling a niche was listed most often as the primary reason for online journal production.

Other primary reasons listed for producing online journals included subscriber characteristics and the ability to better communicate directly with subscribers. For example, reaching an international audience was reported as a goal for publication. A number (34.6%) of the editors reported that the potential audience was a primary incentive for producing online journals and listed the advantages of reaching broader, younger, or more specific audiences.

The third survey question asked about problems with online journal publication. Technical difficulties was the most widely cited problem area cited by 42.3% of the editors, who frequently mentioned difficulty with email delivery packages and problems with server sites. Interestingly, 30.8% of the editors observed that journal contributors faced similar technical difficulties and that writers were not comfortable with the computer formats of the journals. A separate problem identified by the editors was locating journal contributors. This was related to the lack of scientific credibility of online journals. Several editors also noted that reaching a target community whose members were very

paper-oriented constituted a significant challenge.

Commenting on the differences between online and print journal format, cost and speed differences, 50% of the editors described differences in the speed of communications between journal contributors, reviewers, and editors, the review and revision process, or publication of the journal. Although many editors suggested that their online journals were much less costly than print journals, there was still concern over funding sources to sustain and particularly to begin a journal.

On audience and readership characteristics, editors consistently described online readers as being more sophisticated and knowledgeable about technology than print journal readers. Also, perceptions of the Internet and online journals as a global unifying influence were reflected in statements which suggested that online journals reach into corners of the world that would be virtually impossible to do with print media. Also under this question were responses that touched on the lack of a peer-review process that may adversely affect online readership due to perceived journal credibility and accessibility issues, such as the need for good access to the Internet and the fact that print journals can be more easily archived.

The last question concerned the future of online and print journals. Financial concerns were primary with one editor pointing out that it is an economic question while speculating that mechanisms may need to be developed to require payment from readers. In this context, another editor discussed challenges of obtaining support from industry advertisers who need to be brought

up to speed on the benefits of digital advertising. In fact, editors of journals with broad audiences consider financial sponsorship as a primary indicator of their future. Editors of scholarly journals have the added concern that perceived credibility may affect their future. Several of these editors mentioned peer review is needed in order for online journals to be successful in the future.

THE FUTURE

According to Willis (1991), the success of online journals depends on their capabilities, which are superior to paper. Online journals must be able to organize, report, and archive knowledge (information) with lower production and distribution costs than paper journals can. To a large extent, this goal is achievable due to access, storage, and transmission capabilities of the Internet providers. Print journals are becoming increasingly expensive to produce and distribute (Shamp, 1992). Currently, many libraries and individuals cannot afford print journals because of increasing costs related to production and storage. Online journals may provide educators with an information source not otherwise available to them and their students.

Overall, the forecast for online journals seems to be one of increased usage and endless applications. However, a number of the financial, credibility, and security issues described earlier in this article must first be addressed. At this time, many online journals are subsidized by National Research and Education Network (NREN), but this system of financing is likely to change (Collins & Berge, 1994). The future of online journals seems one of divergent paths. Privatization of the Internet has and will

continue to guide changes in regulation, ownership, and use of online journals. The use and sophistication of online advertising will increase because advertisers and editors have only begun to explore the commercial aspects of online advertising. Obtaining information about target users is critical to enlist advertisers, and security and privacy issues related to this need to be solved. Scholarly journals that have limited target audiences will need to find means other than advertisers for financial sponsorship. In addition, scholarly journals will need to standardize, implement peer review, and achieve better recognition among scholars in order to flourish (Piternick, 1989). If they do not, they may become informal specialized newsletters rather than formal journals.

Will there ever be a truly paperless society? Does online success reflect print failure? Opinions may differ as to the future of print media; however, there are several qualities of print journals that online journals do not share. Print journals have a relative permanence with which users are comfortable. Subscribers can touch and hold them. In addition, print journals are typically more portable. They can be taken anywhere, no phone line needed. Most recipients of print journals, however, do not read the journals regularly. Instead, most journal subscribers only select specific articles of interest to read. At the end of the journalism era and during the broadcast media era, print publications were pushed to their limits. Print should continue to survive, but only with a decrease in production and changes in content in order to suit more restricted niches left in the wake of the online journals.

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8. Promoting Gender Equity Through a Technology Day Camp

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This reports on a technology day camp conducted to promote gender equity through computer and technical activities. Sixteen middle and high school students were involved in three areas including computer-assisted drafting, graphic arts, and manufacturing. Results of a survey of student attitudes toward computers and gender equity are discussed.

By the early 1980s, computer usage was well established in schools, but primarily among male students (Alvarado, 1984; Collis, 1985; Lockheed & Frakt, 1984; Miura & Hess, 1984; Sanders, 1985). Differences in computer use between males and females develop early through gender-segregated activities; male-dominated advertising, messages, and software; and the predominance of males with out-of-class access to computers (Collis & Martinez, 1989; Damarin, 1989; Lockheed & Frakt, 1984; Sanders, 1985). When asked about their software preferences, females chose word processing and business or research applications while males were more interested in programming (Lockheed & Frakt, 1984). Damarin (1989) noted that many programs are based on competition with the computer, the clock, or some type of scoring device leading to further female anxiety.

In 1989, Collis and Martinez reported nearly universal computer experience among secondary students during the previous 10 years, although males still outnumbered females in regular computer use. Damarin (1989) also found male dominance in computer labs while females are often denied access due to self-imposed limitations based on math anxiety and their perception of computers and sciences as a male domain.

Methods suggested for improving computer equity include guaranteed access to females outside of class, group interaction, and use of the computer as an educational tool (Sanders, 1985). Alvarado (1984) suggested that teachers screen software for sexism and provide female role models. Teachers must also self-monitor to avoid sexist generalizations and employ gender-fair language and materials (Darling & Sorg, 1993). Such practices “will allow females to compete equally with males in the technologically based American society, where basic computer competence and ability to learn technologically-related job skills are essential” (Taylor & Mounvield, 1994, p. 304).

In an effort to demonstrate that gender bias and stereotyping can be overcome, a technology day camp for students 13 to 16 years old was conducted at a medium-size university in the up-

per South. The purpose of the day camp was to promote technology education among secondary students and particularly encourage female students to consider enrollment in technology-based classes in secondary and postsecondary institutions. The term *gender equity* as used herein refers to equal awareness and access to computer resources including hardware, software, and technology programs in general.

TECHNOLOGY DAY CAMP

Objectives

The primary objective of the day camp was to expose students, especially females, to technical fields and career opportunities thereby increasing their awareness and interests in technology. Further objectives challenged male/female stereotypes in technology careers while maintaining a cooperative learning and working environment.

Participants

Students aged 13 to 16 residing in the local county were contacted and recommended by either their technology education teacher or guidance counselor. Initial enrollment was limited to 45 students with a requirement of 51% females. Twenty students enrolled, and 16 completed the work-